

AMERICAN MUSEUM
Novitates

PUBLISHED BY
THE AMERICAN MUSEUM
OF NATURAL HISTORY

CENTRAL PARK WEST AT 79TH STREET
NEW YORK, N.Y. 10024 U.S.A.

NUMBER 2660 OCTOBER 26, 1978

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Summary of the Seventh Archbold Expedition
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Number 2660, pp. 1-21, figs. 1-12

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HOBART M. VAN DEUSEN¹

ABSTRACT

The Seventh Archbold Expedition worked on the Huon Peninsula of Papua New Guinea from April 12 to October 22, 1964. Members of the expedition occupied several camps ranging in elevation from sea level near Finschhafen to 3500 meters on the Saruwaged Plateau. The principal objective of the

expedition was to collect mammals and plants, but other kinds of materials were also gathered, most notably in the areas of herpetology and entomology. The present report provides an itinerary of the expedition, together with maps and a gazetteer.

FOREWORD

Summaries of previous Archbold expeditions all were organized in much the same way (Archbold and Rand, 1935; Rand and Brass, 1940; Archbold, Rand and Brass, 1942; Brass, 1953, 1956, 1959, 1964). They described the physiography and climate of the study area, presented detailed itineraries and descriptions of the expedition's collecting stations, and discussed previous biological studies in the region. Sometimes expanded treatment was given areas of particular interest of participants in the expeditions (ornithology and vegetation, for example). All reports were copiously illustrated with photographs and maps.

Hobart Van Deuseen (1966) published a brief, semipopular account of the Seventh Archbold Expedition. He had hoped in a more expansive summary to enlarge upon the format established in earlier reports. He envisioned a multi-

authored presentation dealing much more extensively with many topics than was possible with the authorship restricted to the expedition leader, or even the leader and one or two members of the expedition. He planned to write the general material as well as the chapter dealing with mammalogy. Others agreed to provide chapters on botany, ecology, and herpetology. At the time of his death in June 1976, he had the introductory material and most of the proposed chapter on itinerary and routes in manuscript form. None of the detailed descriptions of collecting stations for which he was awaiting botanical information had been written. The great many notes for the accounts of mammalian species in his files are not sufficiently complete to be brought together into the chapter he evidently envisioned. Information on physiography and geology, climate, and history

¹Late Archbold Assistant Curator, Department of Mammalogy, the American Museum of Natural History.

and exploration also was lacking or present only in rudimentary form.

Manuscripts treating frogs and lizards (R. G. Zweifel) and snakes (S. B. McDowell), written as chapters of the summary report, were submitted to Van Deusen in 1972. A manuscript intended as a chapter on vegetation changes at high elevations has since been published separately (Costin et al., 1977), and the herpetological manuscripts also now will be published separately.

Although this report is far less comprehensive than Van Deusen had intended, it nevertheless seems desirable to publish the information. The collections accumulated on the Seventh Archbold Expedition and deposited in the American Museum of Natural History already have been utilized by scientists in the Museum and in other institutions as well, and will continue to serve as a valuable resource. The itinerary, gazetteer, and maps will be important to persons working with the collections or visiting the Huon Peninsula.

The Introduction, Acknowledgments, and Itinerary and Routes appear here essentially as they did in Van Deusen's manuscript. I made small changes in order to reflect the modified political status of Papua New Guinea and to eliminate some material that, with the perspective of several years since the manuscript was written, seemed inappropriate or superfluous. Titles of governmental officers are as of the time of the expedition.

The original manuscript included elevational data in both English and metric systems, but not in consistent fashion. It appeared that in the majority of instances where the English system alone was used, the elevations were rounded to the nearest 50 to 100 feet. I have expressed these elevations in meters, rounded to the nearest 10 to 100 meters, as seemed appropriate.

The maps were prepared by Frances W. Zweifel under Mr. Van Deusen's direction. Photographs were taken by Stanley Grierson.

R. G. ZWEIFEL 1978

INTRODUCTION

The present report summarizes the extensive biological fieldwork carried out in 1964 on the

Huon Peninsula of Papua New Guinea by the Seventh Archbold Expedition of the American Museum of Natural History. The expedition was based at Lae, the administrative center of Morobe Province (then Morobe District). Operations began on April 12 and terminated on October 22. During this period the expedition made major collections on the Rawlinson Range, the Cromwell Mountains, and the Saruwaged Mountains, as well as smaller collections at other short-term collecting localities. Morobe Province includes the Huon Peninsula where all the expedition's work was centered. At the time of the expedition, the Huon Peninsula was part of the Territory of New Guinea, formerly German New Guinea (until 1914), and was with Papua administered by the Australian government as the Territory of Papua and New Guinea. Many German place names persist on the Huon Peninsula, and a few German words are still retained in the "pidgin" language we used, the lingua franca of the region.

Several considerations led to the selection of the Huon Peninsula as the site of the 1964 expedition. The valley of the Ramu and Markham rivers is a relatively low and narrow valley that separates two great mountain masses almost as effectively as would a tongue of the ocean. The divide between the two river systems is almost imperceptible and lies at an elevation of 460 meters. To the south of the valley rise the Bismarck Range, which towers to 4600 meters, the Kratke and the Hertzog mountains; to the north, the Finisterre and Saruwaged mountains of the Huon Peninsula peak at elevations of about 4100 meters. In effect, this "rift valley" biologically isolates these mountain ranges from the central mountain ranges of New Guinea, just as the Vitiaz Strait isolates New Britain from the mainland of New Guinea. One object of the expedition was to determine what species of mammals, present in the central ranges, had failed to cross this valley gap. A corollary object of this collecting trip was to obtain material from the Huon for comparison with the mammal species obtained in the central ranges in 1959 (Brass, 1964). Early workers in bird and mammal taxonomy had described endemic species from the Huon Peninsula. No large systematic collection

of the mammals of the Huon was in existence before the 1964 expedition. The small amount of material available is scattered principally in European museums, and thus not readily available for taxonomic studies. The type localities for a number of mammals and for a much larger number of plants are on the Huon. Studies were needed to prove or disprove the high degree of endemism reported by these early taxonomists.

The participants in the 1964 expedition were: Hobart M. Van Deusen, leader and mammalogist; Ruurd D. Hoogland, botanist and ecologist; Stanley O. Grierson, zoologist and photographer; Kenneth H. MacGowan, transport man and field assistant; and seven permanently employed natives. MacGowan was born in New Guinea, and his fluent command of "pidgin English" was of great value to the expedition. Kim, a native of Goodenough Island and the finest bush cook in our expedition history, was taking part in his fourth Archbold expedition. Edewawa, senior botany assistant, was participating in his third expedition. I was also most fortunate to have Davida, a native of Fergusson Island and my most experienced mammal assistant on the 1953 expedition as my trusted companion. Tobram, our 1959 Chimbu mammal assistant from Mt. Wilhelm, was on his second expedition. After we flew into our primary field base at Pindiu we hired three local men: Tanis, to assist Kim and to help with the interpretation of local languages; Wawaina and Darson to assist Hoogland with the botanical collecting. Since there were but three airstrips in the interior of the Huon in 1964, it became necessary to hire porters at every stage of the expedition to reach and supply our mountain camps. Distances on the Huon are not great but some of the most rugged and mountainous terrain in the Territory is concentrated on this Peninsula. We were most fortunate in our relations with the local people whose willingness to carry expedition gear (for one silver shilling per hour) made it possible for us to establish collecting camps in remote mountain areas.

Collections made on the expedition include about 1200 botanical numbers, about 3000 insects and the following vertebrates: 53 fishes;

497 frogs, 286 lizards, 76 snakes (total 859 herpetological specimens); 101 birds; six monotremes (*Zaglossus*), 311 bats, 929 marsupials, 484 rodents (total 1730 mammals).

ACKNOWLEDGMENTS

The Archbold expeditions to the Territory of Papua and New Guinea have been extremely fortunate in their official relations with the Australian Administration. We always had complete cooperation and generous help not only from Brigadier Sir Donald M. Cleland, Administrator, and Dr. John T. Gunther, Assistant Administrator, but also from field personnel right down to the newest Cadet Patrol Officer. It has been my particular pleasure to have known Dr. Gunther since the first Archbold post-war expedition in 1953. Dr. Gunther took a personal interest in our work and gave us friendly advice and help on many occasions. Mr. David M. Fenbury, Secretary, Department of the Administrator, gave me his aid in obtaining official sanction for the 1964 expedition. His personal friendship and interest both in New York and Port Moresby are deeply appreciated.

We are indebted to Dr. John S. Womersley, Chief, Division of Botany, and Curator of the Herbarium in Lae more than to any other person in New Guinea. Space for uncrating expedition supplies and for the storage of botanical and zoological specimens was generously made available. Acting as coordinating officer between the Administration and the expedition, John gave us invaluable help in arranging the transport of supplies and collections on aircraft under official charter. In addition, we enjoyed the advice and friendship of his staff in discussing collecting localities and local problems. On the several occasions when the expedition personnel returned to Lae on business Mrs. Womersley invariably extended generous hospitality to them.

Our business manager in Lae for the duration of the expedition was Mr. Norman C. Osborn, an experienced customs and shipping agent. The many details of import and export permits, the supplying of the expedition in the field, and the handling of our official business were carried out most efficiently.

I thank Mr. O. J. Mathieson, Acting District Commissioner of the Eastern Highlands District, for his aid in locating and sending Tobram, a Chimbu from Mt. Wilhelm, to expedition headquarters in Lae. Tobram was a valued mammal collector and preparator on the 1959 expedition to the Bismarck Range.

It is asking a great deal of a person to give up an efficient cook and store manager, but Ailsa M. Gribben of Goodenough Island very graciously gave Kim leave of absence for the duration of the expedition. Kim is not only one of the finest bush cooks in New Guinea, but he is also an enthusiastic hunter and trapper. This marked the fourth Archbold expedition in which he participated. We are also indebted to Miss Gribben for arranging transport for Kim and Edewawa, also a native of Goodenough Island and a member of two previous expeditions, to Lae.

The late Mr. Alan T. Timperley, District Commissioner of the Morobe District (the district in which the Huon Peninsula is located) made us welcome and extended the courtesies of the Administration to the expedition. The District Officer, Mr. D. N. Ashton, joined us on a flight to the Patrol Post of Pindiu on April 16, where he introduced us to the Patrol Officer in charge, Ron Willard, and Mrs. Willard. At Pindiu we were offered a good timber house for the storage of supplies and specimens, and a "grass house" for our working and living which had formerly been the Willards' home. Mr. Des Ashton was more than generous with his time on behalf of the expedition. During our stay at the Pindiu Patrol Post we became close friends of the Willards. Their thoughtfulness and hospitality did much to lighten the routine of our high pressure collecting.

Mr. Tony Heriot, Patrol Office at Kabwum, and Mrs. Heriot extended every courtesy to the expedition, and graciously presented a valuable stone mortar and pestle, unearthed during the excavation of the local airstrip, to the American Museum of Natural History. Lionel Tilley, Agricultural Officer at Kabwum, enthusiastically aided us in collecting spiders during our enforced stay at Kabwum due to bad flying weather. Mr. Ian Rowles, Agricultural Officer

at Pindiu, gave us invaluable help during the months that the expedition was based at Pindiu.

Laurie and Betty Crowley, owners of Crowley Airways Pty. Limited of Lae and old friends from the 1959 expedition, were meticulous in their planning of air transport for expedition personnel and supplies. Laurie and his fine crew of bush pilots negotiated the postage-stamp size airstrips of the Huon Peninsula with perfect aplomb.

Archbold Expeditions is deeply indebted to: Mr. William Conway, the Acting Director of the Department of Agriculture, Stock and Fisheries, for issuing collecting permits; to Mr. K. M. Chambers, Chief Collector of Customs, for expediting the entrance of collecting gear and supplies; to the Hon. J. K. McCarthy, Director of Native Affairs, for permission to export native artifacts; to Dr. J. J. H. Szent-Ivany, Senior Entomologist, for his hospitality and for the gift of a very young *Tachyglossus aculeatus*; to Mr. Alan Charles, Plant Industry, Mr. T. Rothwell, Animal Industry, and Dr. M. Rapson, Fisheries, for their kindness to expedition personnel.

The Hon. H. L. R. Niall, former District Commissioner of the Morobe District and later the first elected Speaker of the House of Assembly, was a special friend of the expedition and stood ready to help us on any occasion. He is one of the "greats" in the Australian history of administering the Territory of Papua and New Guinea.

The expedition is indebted to the Commonwealth Scientific and Industrial Research Organization for providing botanical equipment and for allowing Dr. R. D. Hoogland to participate in the Seventh Archbold Expedition.

The members of the expedition express their everlasting gratitude to the native peoples of the Huon Peninsula. They were willing, cheerful, always cooperative even though our collecting idiosyncrasies were often a puzzle to them, generous in their help, and invariably friendly. We wish them well at a time in their history when their social customs and deeply rooted way of life are under intense pressure from the outside world. These people are our friends.

The expedition was supported in part by grant GB-1530 of the National Science Foundation.

ITINERARY AND ROUTES

The area of the Huon Peninsula in which the expedition operated is mapped in figure 12, and a gazetteer of pertinent localities constitutes an Appendix to this report.

APRIL

MacGowan arrived in Lae from Brisbane April 5, Hoogland from Canberra on April 7, and together they began to uncrate the expedition cargo sent from Canberra and New York. As was the case in 1959, John S. Womersley, Chief, Division of Botany, and Curator of the Lae Herbarium, very generously extended the use of the botany work shed to the expedition for the storing of specimens and working of cargo. Grierson and I flew to Port Moresby from Brisbane April 12; Grierson continued on to Lae while I remained in Port Moresby to consult with various Administration officials on expedition business. Approval for the conduct of the Seventh Archbold Expedition to New Guinea (1964) appeared in the Territory of Papua and New Guinea Government Gazette No. 14, page 310, March 19, 1964, published in Port Moresby.

I flew to Lae on April 14. At a conference of the expedition personnel that evening it was decided to make the Pindiu Patrol Post the base of operations for the Rawlinson Range-Cromwell Mountains phase of the trip. The original plan to begin work in the Finschhafen-Sattelberg area was abandoned on the strength of an unfavorable report on the vegetation of the Finsch Coast based on aerial reconnaissance by Hoogland. Lack of suitable transportation was an additional factor in the decision. April 15-19 was spent in Lae organizing food and collecting supplies, obtaining firearm permits and meeting Administration officials.

On April 16 I chartered a light plane from Crowley Airways to fly District Officer D. N. Ashton, Hoogland, myself and 800 pounds of cargo to the Pindiu Patrol Post about 40 miles

ENE of Lae. The flight was made in good weather; the steep-sided valleys and the densely forested ridges of the Rawlinson Range gave promise of excellent collecting and much hard walking. The Rawlinson Range rises abruptly from the northern coast of the Huon Gulf, and roughly parallels the east-west coastline. The southern aspect of the range shows no sign of native population. The upper elevations of this range (Mt. Rawlinson, 2270 meters, is the highest peak) are usually in cloud, so that aircraft headed for Pindiu fly east along the coast until the lower course of the Mongi River is sighted. The turbulent, boulder-filled Mongi, which has its source in the high eastern peaks of the Saruwaged Mountains, is the longest river on the Huon Peninsula. The Mongi is then followed upstream (north) until the Pindiu airstrip on the west side of the river comes into view. Two major tributaries, the Bulum and the Kua rivers, which join the Mongi from the west, are passed during the flight.

We were met at Pindiu by Patrol Officer Ron Willard and Mrs. Willard. The grass house on the ridge overlooking the airstrip, formerly the home of the Patrol Officer, was offered to the expedition for the duration of its stay in Pindiu. Most New Guinea villages have what is called a "House Kiap" for visiting Administration personnel on tour and other visitors. A good timber house near the airstrip, for bulk supplies and for sleeping quarters for our native staff, was also made available. We returned to Lae before noon on April 16, covering in 30 minutes' flying time a distance which a carrier line would have taken nearly a week to negotiate on foot.

MacGowan flew to Pindiu in Laurence Crowley's twin-engined Piper Aztec with the second lot of cargo on the morning of April 20. Grierson and Tobram followed with additional supplies on an afternoon flight in poor weather. Hoogland and I flew to Pindiu on April 21 with the remaining cargo.

Pindiu, at an elevation of 915 meters, served as a shake-down camp for the remaining days of April and as the expedition's field base for the first three months of the expedition. Mammal and herpetological collecting began imme-

dately. Mist nets, set in a sago palm swamp below the village, caught the bats *Syconycteris* and *Paranyctimene*. Traps took mostly *Rattus exulans*, and night hunting produced only *Dobsonia*, the only large fruit bat at Pindiu at the time of our visit. The vicinity of Pindiu is in garden plots for the most part, and little primary forest remains in this sector of the valley. However, the active felling of forest and the making of gardens resulted in a fine collection of snakes. Silver shillings were incentive enough to ensure such specimens being brought in alive from a radius of several miles for our photographer, Grierson. Low clouds misted in our camp one night in two, and a good frog chorus was common on our ridge. We tape-recorded the songs of several species.

Small airstrips in the interior of the Australian administered Territory of Papua and New Guinea have played a most important role in the post-war administration and economy of the eastern half of New Guinea. The strip at the Pindiu Patrol Post is a case in point. D. N. Ashton, District Officer of the Morobe District in 1964 (and later District Commissioner of the same important district), has kindly sent me the following notes on the history of the establishment of the Patrol Post at Pindiu and the building of the present airstrip.

"When I arrived in the Morobe District on 28 May 1958 there was a Patrol Post serving the Pindiu area situated at Yanzain (Yungzain) in the Dedua Census Division [Finschhafen Subdistrict]. Access to Yanzain was by Land Rover over an atrocious road from Heldsbach on the [Finsch] coast through Sattelberg to Nanduo [Kotte Census Division]; thence a two and one-half hour walk from Nanduo to Yanzain. This place was extremely poorly located, and, because of this, was closed by me on my first visit to the area in January 1959.

"I immediately set about finding a more suitable site and chose Pindiu [Hube Census Division] for the purpose. There was in existence at that time a small grass strip at Pindiu. This was some 1,100 feet long, but could only be used by the Piper Cub aircraft of the Lutheran Mission.

"I personally made several trips into the area, and, as a result, arranged for the Depart-

ment of Civil Aviation to inspect and draw up plans for a more adequate airstrip. The survey was completed by July 1959, and construction commenced immediately thereafter.

"The first officer posted to Pindiu was Mr. P. J. K. Broadhurst. He was followed some short time later by Mr. P. G. Whitehead. The strip was opened in May 1960, and the first aircraft to go in was piloted by Laurie Crowley [now owner of Crowley Airways of Lae] with a District Airport Inspector and me as passengers. The airstrip has been extended slightly and the general condition considerably improved since it was originally opened. It is now classified as Category "C" and can take aircraft of the following types: most Cessnas, single or twin Otters, Piper Aztecs, Beech Barons and a number of others."

One final commentary on this grassed airstrip is in order. During the first week of my stay at Pindiu we regularly heard an unidentifiable mechanical droning in the distance. The mystery was solved one day when we walked down to the strip to meet a scheduled flight. There was a gasoline lawn mower in full operation! We learned that mowing the airstrip was a cooperative venture on the part of several of the Pindiu men. Thus comes civilization to Stone-Age New Guinea!

On the advice of Patrol Officer Willard we decided to set up our first bush camp several miles down (south) the Mongi River in an area of unbroken rain forest. During the final days of April, MacGowan, with the help of Willard, sent out a call for carriers to all the villages near Pindiu.

MAY

Carriers assembled at Pindiu on May 2, and in the early hours of May 3. The carriers were "lined" in front of our rest house and were assigned their loads by MacGowan. A load of 35-40 pounds is the agreed limit for both men and women. Expedition black boxes weighing up to 75-80 pounds were lashed on poles and secured by bush vine; these were two-man or woman-loads. Smaller articles such as kitchen gear, shotguns, and large live traps that would not fit into our standard boxes or swag bags were eagerly sought by the younger boys and

girls. In all my experience in New Guinea no item of expedition gear has ever "gone bush." It is a joy to live with such honesty, and a credit to the native men and women who became our friends. To the uninitiated the "lining" of carriers is a scene of confusion, but, with an experienced man in charge like MacGowan, the good-natured grabbing for the lightest loads soon resolves itself and the carriers break for the trail often chanting and shouting as they go.

Since it is very difficult to appraise the quality of camp sites when talking to people who are not naturalists, we decided to make our way toward the lower reaches of the Mongi River following trails connecting the established villages. The vicinity of each village is much too disturbed to be of any value to a collecting expedition, but we hoped to find a suitable site between villages. Our route from the rest house on the Pindiu ridge led south "across the grain" of the drainage system.

The carrier line left at 9 A.M. We still required about 20 additional men for two-man loads. The natives at Pindiu had reached the degree of sophistication where they were no longer interested in trade tobacco and newsprint as payment for services. Hard money, in this case the silver shilling, was now the accepted medium of exchange. Grierson and I left at 10 A.M. The trail immediately drops into a small stream bed at 840 meters. At eleven o'clock we neared the top of the ridge opposite 1065 meters. The weather, which had threatened heavy rain early in the carry, now cleared, but the trails were still treacherous. A few minutes later we entered the small village of Pependangu with its well-swept red-earth foundation. From its ridge-top location one could see to the southwest the heavily forested Rawlinson Range which fronts on the Huon Gulf. This range was later to be one of the prime objectives of the expedition and the virgin aspect of the terrain augured well for future collecting. After leaving the village and its garden plots the trail followed the contour to the west and then south to the crest of the second ridge south of Pindiu, and then led down the long ridge running southeast to the Mongi River. While still some distance from

the Mongi the trail turned south again and dropped sharply into the bed of a beautiful rushing stream called the Masba at 580 meters. We arrived here at 12:30 P.M. About an hour after crossing the Masba we came to one of the main tributaries of the Mongi, the Kua at 440 meters, which drains a large mountain-encircled valley in the heart of the Huon Peninsula. Having passed through what appeared to be largely undisturbed forest between the Masba and the Kua, I recalled the carriers, who were waiting at the Kua crossing, and we retraced our steps to a small but level stretch of forest just south of the Masba Creek crossing and high above the Mongi to the east. Here we made camp at an elevation of 610 meters.

The Masba Creek camp was in operation from May 3 until May 23. At the Masba we were introduced to a practical way of supplying the camp with water. Seven- to eight-foot sections of bamboo 4 to 6 inches in diameter were cut, and the septum at each joint pierced. Carrying water is usually women's work but here both sexes joined in.

Clearing the camp area, digging latrines, cutting trails in the dense forest for jacking, and building tables and benches (with thin saplings and bush string) usually occupy the first full day in camp. Personnel were continually on the lookout, however, for frogs, lizards, insects, and mammals disturbed during the clearing operations. In fact, one short-legged lizard, found under the wet leaves, turned out to be a new species, *Sphenomorphus anotus* Greer, 1973. This and later finds point up the importance of close observation when any fresh ground is broken in New Guinea forests.

The rigorous routine of a collecting camp quickly took over. We were at the upper limit of rain forest at an elevation of about 610 meters. On the first night of jacklighting Grierson shot a tube-nosed bat (*Nyctimene*). This female, which appeared to be nursing, was only stunned and remained very much alive. Returning to the same area the next night Grierson heard a low squeaking, and after a careful search found a two-third's grown *Nyctimene* on a low branch. The female had without doubt become separated from the baby the night before as a result of the shooting. When presented to the

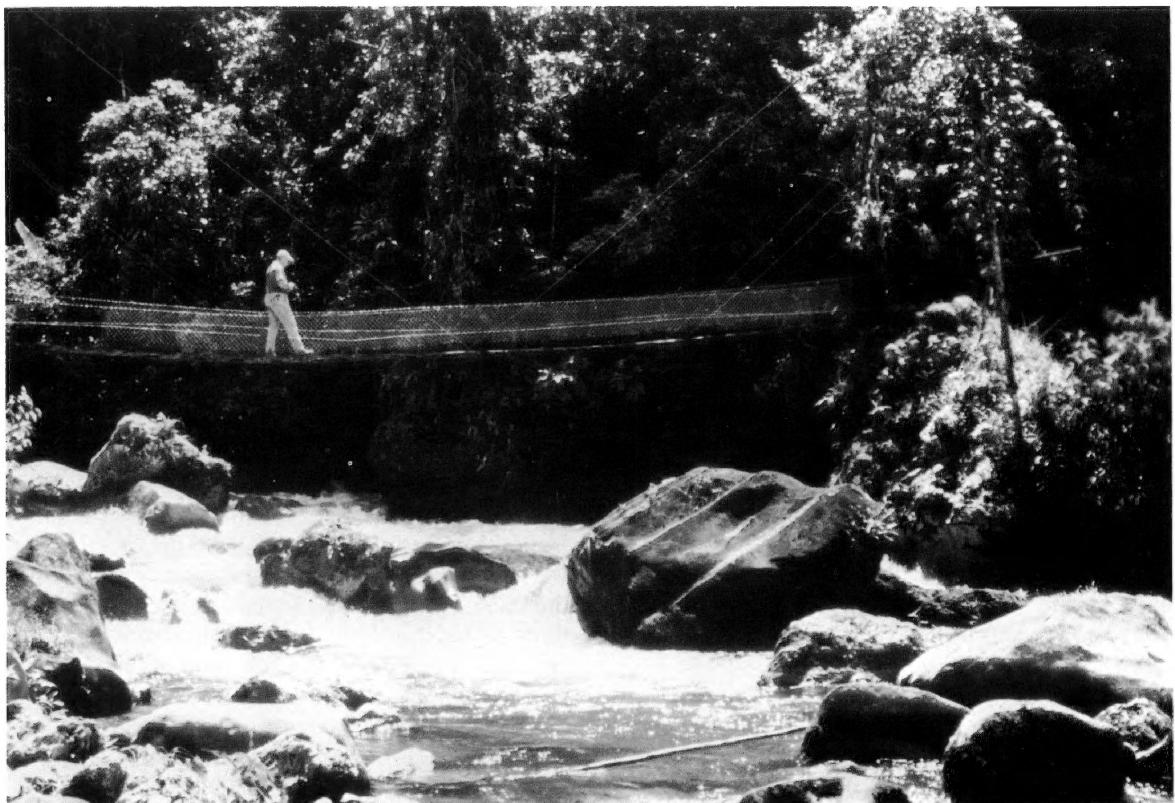


FIG. 1. Bridge over the Mongi River near Pindiu.

female in camp, the young was readily accepted and began suckling immediately.

The return carry to Pindiu was made successfully on May 23. The period from May 24 to 29 was spent reorganizing our gear for the trip to Rawlinson Range. MacGowan flew to Lae to replenish our food supplies. Hoogland took this opportunity to collect a *Pandanus* and a number of palms. On May 25 Grierson and I investigated a local limestone cave located about 3 miles north of Pindiu and one-quarter of a mile north of the junction of the west-flowing Foria River with the Mongi River at an elevation of about 580 meters. Masses of flowstone a few feet inside the entrance, out of which flowed a small stream, prevented any exploration of Buma Cave, but we mist-netted the entrance and at dusk we captured 18 *Hipposideros*.

A call for carriers to assemble on May 30 went out during this period. The carry from Pindiu to the village of Zangaren on the north-

ern slopes of Mt. Rawlinson, was a difficult one. May 30 saw us "break" (cross) the Kua River at an elevation of about 470 meters. We then passed through the Lutheran Mission Station at Mindik with its airstrip (one of four on the Huon Peninsula) and spent the night at the village of Tumnang where we collected frogs. At Mindik we were cordially received by Mr. and Mrs. Werner Jacobsen, German Lutheran missionaries, who told us about a small natural history museum with New Guinea specimens at the Lutheran Training Center in Neuendettelsau, Germany. May 31, a Sunday, turned into a day of rest and a night of frog collecting at Tumnang because the carriers preferred not to work.

JUNE

On June 1 we traversed the uplands between the Kua and Bulum rivers. This was an easier carry than the first day because it involved only modest dips and climbs out of creek beds of

less than 300 meters. We encountered our first beech tree (*Nothofagus* sp.) at an elevation of 1420 meters as we approached the divide between the rivers at 1500 meters. Noon found us in Ogeramnang. Near here in 1929, Ernst Mayr collected a peculiar long-footed rodent that became the type of *Leptomys ernstmayri*. Later in the month we were to collect a fine series of topotypes of this hydromyine. We spent the night at Selimbang (1480 m.) after passing through the villages of Kemai and Semgeta. June 2 saw us "break" the Bulum (760 m.), a roaring mountain torrent with its headwaters in the distant Saruwaged Range. We passed near the village of Maran (980 m.) on the way to the log bridge crossing. The rough slippery trail now led up the forest covered slopes of the Rawlinson Range. Here and there we found natives clearing the primary forests for gardens. At 940 meters we saw our first *Rhododendron* sp. We passed through the old village of Zangaren at 1160 meters, and the six-hour carry

ended at Zangaren no. 2 on the north slope of Mt. Rawlinson at 1370 meters. Gaytson, the village counselor, whom I had met at a gathering of counselors chaired by the District Officer, Des Ashton, in Pindiu, promised to show us a good camp site near water the next morning. The village was perched high above the Bulum River with a dramatic view northwest to the Saruwaged Range and northeast toward the Cromwell Mountains, our two next objectives of the trip. We spent the evening trading for trophy skulls and "sing-sing" artifacts made with cassowary feathers. We began to realize how important the cassowary (Quela) was in the lives of these people on the Rawlinson Range. Two useful tools are made from cassowary long bones: *sut* from the femur, and *dubat* from the lower leg bone. We also bought arrows that were pointed with the long sharp cassowary toenail.

On June 3 a morning's carry brought us to a lovely rushing stream called Gang on the east



FIG. 2. Tree ferns on trail between Masba Creek and Pindiu.



FIG. 3. View up the Bulum River valley toward village of Maran from region of Selimbeng.

flank of Mt. Rawlinson. The Zangaren people helped us clear a camp site about 100 feet above and east of the Gang which flowed and tumbled north to the Bulum River. Even as camp was being set up we found two *Paranyctimene* roosting in undergrowth 6 feet above the ground. We also noticed the men bringing in huge banana leaves from the forest for temporary shelters. Hoogland later traced these to their source and found a "tree" measuring 47 feet in height, and more than 7 feet in basal circumference. *Musa ingens*, described only two years before this expedition, had small fruit with large black seeds. We obtained our drinking water from a tiny stream called Mut on the South perimeter of camp. We later trapped a young *Hydromys* here.

The Gang Creek Camp was the center of mammal collection until July 5. On June 29 Hoogland and Lyn Craven, a young assistant visiting from Canberra, transferred their botanical collecting from the Gang to a "Top Camp"

on Mt. Rawlinson at 1830 meters. Dr. Richard G. Zweifel arrived in camp on June 21 as a guest of the expedition; he collected herpetological specimens and made recordings of frog calls until June 30 when he left for Pindiu and eventually Lae, to work independently elsewhere in New Guinea. On June 18 MacGowan climbed to the summit area of Mt. Rawlinson (not the true summit as we learned later); his altimeter read 7390 feet (2252 m.). On June 19 we were visited by people from the various small villages on the north slopes of Mt. Rawlinson. The sing sing lasted far into the night; Grierson and I were still recording the drum music at one o'clock in the morning. On June 30 a hunter brought us the first *Zaglossus* of the trip.

JULY

On July 2 Van Deusen and Tobrum visited Hoogland's "Top Camp" and then climbed to the true summit of Mt. Rawlinson. Adzing, our

guide from Zangaren, absolutely refused to continue beyond a certain point (possibly MacGowan's "tree summit"). Tobram and I pushed on through the "mossy forest," which had a sprinkling of small but colorful rhododendrons, until we reached a point when our altimeter read 7450 feet (2270 m.). The peak was tree covered and even though the day was fair and without clouds (a rare event) we could not see any distance through the trees. On this climb we passed a small water hole at 1980 meters; we were told that this was the last water (highest) on this limestone mountain. On the walk to the summit we entered a large glade in the forest (elevation 2120 meters) which Adzing called "place bilong muruk." Many cassowary droppings containing large fruit pits were concentrated at this spot. We left the summit at 2:30 P.M. (altimeter still reading 7450 feet) and arrived back at the Gang at 5:30 P.M.

On July 5 this highly successful camp was broken and carriers from Zangaren and other

villages carried our gear back to Zangaren no. 2, this time by a different route than the original carry. We passed through a number of new garden areas at an elevation of about 1500 meters. July 6 was spent at Zangaren repacking our specimens and gear for the four-day carry back to Pindiu. That evening the village counselor, Gaytson, was our host in his compound for a *muruk* feast set out on homemade tables. Vegetables from the mountain gardens were far easier to chew and more palatable than the tough, greasy cassowary meat, but we did our best to show our appreciation by much smacking of lips. Then followed speeches in pidgin English and local dialect by the counselor, various luluais (chiefs) and tultuls (secondary chiefs) and finally a speech in pidgin by myself to thank these helpful people for their hospitality while we were on their mountain which they call Zebunung. And again, the hourglass-shaped drums were alive until the early morning hours.



FIG. 4. Ridge-top village of Zangaren.



FIG. 5. Giant banana plant, *Musa ingens*, at Gang Creek camp.

July 8 saw us break the Bulum River for the last time on our way to Maran, Selimbang, and finally Ogeramnang, where we spent July 9 as the guest of the native pastor in his home.

MacGowan stayed behind at Zangaren no. 2 to await more carriers. Craven departed for Pindiu by way of Tobou with a guide. This was a day of great excitement. Two more *Zaglossus* were brought to us from the mountains farther north near the upper Bulum River. While at Ogeramnang I wrote to Ernst Mayr to remind him of his collecting days 35 years before our visit. I decided to return to Pindiu by a different route, not only to get some idea of the broken country between the Bulum and the Kua rivers but also to advise some of the villages to the north that we would need their help in carrying to the Cromwell Mountains. We passed through the village of Tobou, broke the Kua River, and climbed out of the gorge to Yapang where we spent the night. Kim, our cook, stayed behind at Tobou to enlist more carriers, and arrived in Yapang after midnight. It rained in the morning and a number of humus frogs (*Xenobatrachus rostratus*) that were calling were collected for Zweifel. July 11 and a five-hour carry saw us back at our base camp at Pindiu. July 12, one of a number of fair days, saw us drying skins and packing collections to be flown back to Lae. On July 13 Hoogland flew to Lae with botanical and mammal specimens for storage. Our live *Zaglossus* were photographed at length by Grierson. We supplied them with portions of a broken-open ant hill, but they paid no attention to these adults. July 14 saw MacGowan fly to Lae to renew our supplies; Hoogland returned to Pindiu. I spent part of the day skinning out a *Zaglossus*, a demanding task. On July 16 we saw Hoogland off for the Cromwell Mountains. More knockdown boxes were filled with dried mammal specimens, and I flew to Lae at 4:30 P.M. On July 17 I reported the expedition's future plans to the District Commissioner, Alan Timperley, and to the District Officer, Des Ashton, mailed film, pickled a *Zaglossus*, picked up an ammunition box of silver shillings (to pay carriers), photographed in the Gardens, and at night with Zweifel collected frogs and geckos. On July 18 I was offered a cuscus from the Finschhafen area of the Huon Peninsula by Dr. Brass's transport officer on the 1956 Archbold Expedition, Lionel Evenett. This was a stroke of good luck because the expedition had had no opportunity to collect in rainforest near sea level. I pho-

tographed *Phalanger maculatus* and *Dendrolagus goodfellowi* at the Evenett home. However, he would not allow me to make a specimen of his pet tree-climber!

Laurie Crowley flew MacGowan, Grierson, and myself to Pindiu on July 20. Packing for the long carry to the Cromwell Mountains occupied July 21. I finished making up the *Zaglossus* study skin. R.D.M. Cleland, the son of the Administrator, Sr. Donald Cleland, was at the Patrol Officer's home for a visit, and showed great interest in the work of the expedition.

In spite of a shortage of carriers at Pindiu, Grierson and I left on July 22 for the village of Berakwaiyu at 9:30 A.M. and arrived in the rain at 2:30 P.M. (elevation 1490 meters). A second day of carrying took us to Yapang (elevation 930 m.) where we stayed on July 23 waiting for MacGowan and his carriers to catch up; MacGowan came in with the cargo at 3 P.M.

Bat shooting was good at dusk. On July 25 we had a surplus of carriers and we passed through the village of Nengit and arrived at Lalang (elevation 1370 m.) before noon. July 26, Sunday and heavy rain were a combination that discouraged carriers from leaving their villages. July 27 saw us with enough carriers to reach Podzorong, and finally Avengu (elevation 1620 m.) at 1:30 P.M. For several days we had been following the height of ground far above the Kua River making for its steep northern head wall. Avengu was the jumping off point for the broad divide between the Kua River and the upper reaches of the Mongi River. Heavy rain kept us in Avengu July 28, but on July 29, even though there was light rain, the carriers left at 8 A.M. for the longest and most difficult carry of the expedition. The track was often root-covered and slippery as it climbed to the height of land at 2530 meters. However, there was much of interest to distract us from our



FIG. 6. Close-up view of forest at Gang Creek camp, showing dense, tangled vegetation with heavily mossed tree trunks.

footing. All the way from 1650 meters in kunai grass to 2130 meters the rain encouraged the humus frogs (*Xenobatrachus rostratus*) to call almost continuously. We collected as many as we could during our rest stops, never suspecting that these would be almost the last of this species that we would encounter during the expedition. In fact, after reaching the Mongi River drainage we never heard another of these curious little frogs with their ventriloquial piping calls. Hoogland's camp, which came to be known in my notes as the "Plains of Ulur Camp" came into sight at 4 P.M. The carriers set up camp just within the fringe of the tall forest and bedded down in bark shelters for the night. Hoogland had set up camp on a high rise of ground in the grassland just outside the edge of the forest, and about 100 yards above and to the west of where the Mongi River emerged from the forest (fig. 7). The view to the north to the beautiful forest-covered ridge of the Cromwell Mountains was a striking and never

to be forgotten sight. The elevation at our camp site was 2380 meters.

AUGUST

The Plains of Ulur Camp, or Mannasat, the native name for the locality, was to be one of the most pleasant and interesting "homes" I had ever had in New Guinea. We remained here until August 31. Mist nets, museum specials, Victor rat traps, Hav-a-Hart live traps, steel traps of two sizes, snares, and ground pits were soon in action. We were again fortunate to have several hunters with their dogs to assist us from time to time. We also set up a bowl-shaped reflector lined with aluminum foil on a tripod, and put a Coleman kerosene pressure lamp in the center of the reflector. This threw up a beam of light that attracted moths which in turn attracted bats. As they flickered through the narrow cone of light we attempted to shoot them on the wing. MacGowan, who had been a



FIG. 7. Plains of Ulur camp (Mannasat) at forest edge (see fig. 8).



FIG. 8. View across kunai grass plain from base of Mt. Semieng toward camp site (fig. 7), the tiny white area along the forest-plain margin in the left half of the photograph.

champion rifleman in Port Moresby, became our most successful wing-shot at this camp.

There is a mystery about the name Ulur. One of the high peaks on the Cromwell Ridge is plainly marked "Mt. Ulur" on the Huon quadrangle of the Army Map Series (5B55-11; 1:250,000), but natives from Indagen who own the ridge, and our carriers from Avengu had never heard of the name "Ulur." They had their own names for the several peaks (fig. 9): from east to west, Semiang, Kwarakambuk, and Upasenga (the highest). On August 11 MacGowan and Tobram set up a climbing camp at the southern edge of the Cromwell Ridge, and early on August 12 they climbed Kwarakambuk and then Semiang (Mt. Ulur?). The altimeter on top of the latter pak read 9370 feet (2856 m.). The summit of the ridge was almost a razor-edge in places, and they were forced to cut trail through the dense "mossy forest." From the peak they could see out through the moss-covered branches, and looked across the kunai-covered "Plains of Ulur" camp 5 miles to the south. On August 19 Grierson, Tobram, Edewawa (one of Hoogland's "flower-flower boys"), and I climbed Kwarakambuk and "Mt. Ulur" (altimeter 9400 ft.; 2865 m.). On the way to the ridge we flushed two grass owls (*Tyto longimembris pa-puensis*). We also passed a fair-sized stream

that suddenly dropped with a roar into a sink-hole in the limestone based plain and thundered away under our feet (fig. 10). The crest of the ridge was crowded with the stems of a graceful and delicate species of tree fern. The red petals of a climbing *Rhododendron* added a splash of color to the trail to Mt. Semiang. MacGowan set up a base camp on August 19 preparatory to climbing Mt. Upasenga on the twentieth.

[No itinerary was written for the period August 20-30, spent at the Plains of Ulur camp, nor for August 31, spent on the trail from that camp to Indagen. Hoogland had already (Aug. 24) left for Indagen.]

SEPTEMBER

The carry from Indagen (1830 m.) to Iloko (1680 m.) was made in six hours on September 1, a fair, hot day that was relieved only by a swim in the cold waters of the Kwama River which takes its source in the high Saruwaged Mountains. We crossed the grain of the country, passing through a number of small villages. Nearly all the land was under cultivation or had been cut over in recent years. At Iloko we traded for artifacts and trophy skulls and lined up carriers for the final carry to Kabwum on September 2. During this six-hour journey we had the good fortune to collect a humus

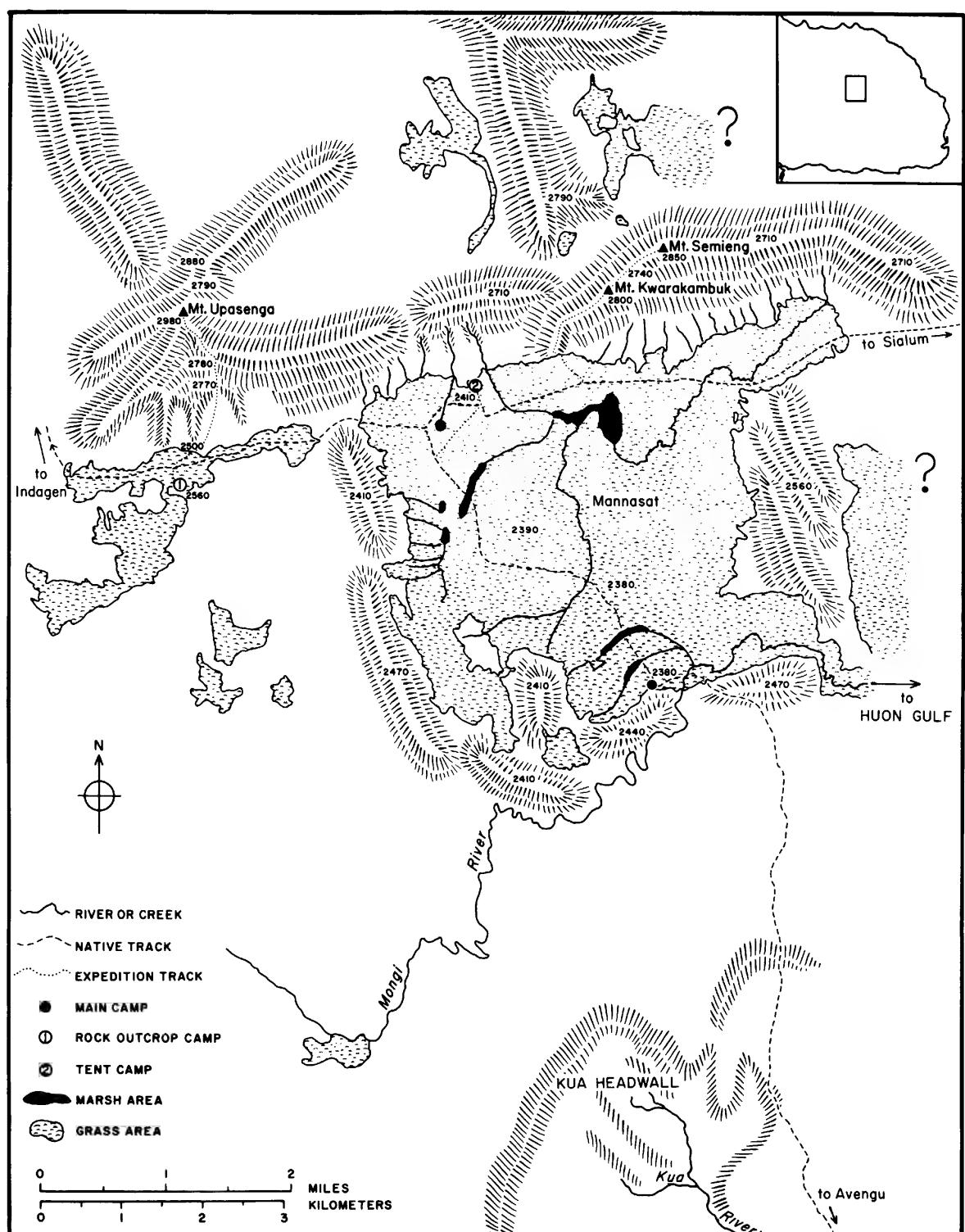


FIG. 9. Plains of Ulur and vicinity. Areas in white on this map are largely occupied by forest.



FIG. 10. Stream on Plains of Ulur at its entry into sinkhole.



FIG. 11. Tree ferns in grassland, Plains of Ulur region.

frog (the first we had seen since leaving the Kua) on a mountainside (1770 m.) just south of the village of Indum. Kabwum (1520 m.) was reached at 1:30 P.M. and we were promptly invited for drinks by Patrol Officer Tony Heriot and Mrs. Heriot. We wirelessed Crowley Airways to pick us up the following day, but we were to be held in Kabwum for six days by bad weather either in Lae or Kabwum. Each morning would see us packed and waiting on the airstrip, which slants from south to north at an angle of 15 degrees. A cliff partially blocks airspace a few hundred feet beyond the north end of the strip. Every mountain landing field has its own personality in New Guinea! However, accidents are few and far between. The Department of Civil Aviation has strict rules, and New Guinea boasts some of the finest bush pilots in the world. The long delay was not without profit. What is probably the largest one-locality collection of spiders in New Guinea was the result. We were enthusiastically aided in the collecting by Lionel Tilley, the young Agricultural Officer stationed at Kabwum. Finally on September 8 the single engine Otter arrived, and after all the expedition gear and personnel were carefully weighed (load limits were strict) we left for Finschhafen. We followed the course of the Kwama River to the north coast at Vincke Point, passing over large areas of forested hills, and then turned east following the coastline to the grassy 10,000-foot airstrip at Finschhafen. In the 1920s, somewhere on this northeast coast of the Huon, Rollo Beck, the famous bird collector for the Whitney South Seas Expedition, landed and visited Sevia in the Cromwell Mountains. He collected birds and a few mammals. At Finschhafen we met Brian Lee, who invited us to use a Civil Aviation house when we returned from Lae. We arrived in Lae at 2 P.M. after a 40-minute flight and saw our precious collections safely stored in the Botany shed.

We arranged to sail on September 11 on the small ship "Beringa" with Capt. Edward Foad, who was on his way to the Siassi Islands. Leaving at 10:15 P.M. we had a calm all-night trip through the Huon Gulf of Malasiga, arriving at 6 A.M. on the east coast of the Huon Peninsula, and then on to Dregerhafen at 8

A.M. We hired a battered Jeep and moved into our new "home" on the Civil Aviation grounds, a beautiful palm-studded spot on the shore of the Solomon Sea touched by the southeast trade winds. Bats were to be our constant companions for the next two weeks.

Bat collecting may be pursued anywhere up to 3000 meters in New Guinea, but if one wants a variety of species he stays below 900 meters. This was our first opportunity during the expedition to collect near sea level. This was our prime reason for leaving the high Saruwaged to our botanist and ecologist friends (Hoogland and Costin) and taking the low road instead. Much as I love the high alpine country on top of New Guinea it was an excellent decision as events during the next two weeks proved. Grierson and I immediately asked everyone within reach if they knew of any bat caves. The Agricultural Officer had a native assistant who said he knew a cave in the ridge that overlooked the airstrip. The cave was no myth. At 150 meters above sea level in ancient coral we entered a stream-eroded winding tunnel with bats galore in various chambers. In the first high-ceilinged "room" we found *Hipposideros diadema*; it was too dark for *Dobsonia*, which like twilight chambers with plenty of flying room.

[Van Deusen's itinerary ends at this point. He continued collecting in the vicinity of Finschhafen until September 26, when he and Grierson went by boat to Lae. Grierson left Port Moresby for Australia on October 4, and the expedition terminated with Van Deusen's departure from Lae on October 22.]

GAZETTEER

This gazetteer includes those place names on the Huon Peninsula mentioned in the text as well as others for orientation purposes or because specimens were obtained there. The coordinates given are *not* the exact coordinates of the locality in question, but represent the closest intersection of the five minute ticks marked on the borders of the map (fig. 12). They serve merely as an aid in finding the locality on the map. For rivers, the coordinates mark the mouth of the river (at the ocean, or at its confluence with a larger stream). Numbers and letters in parentheses refer to collecting localities indicated on the map.

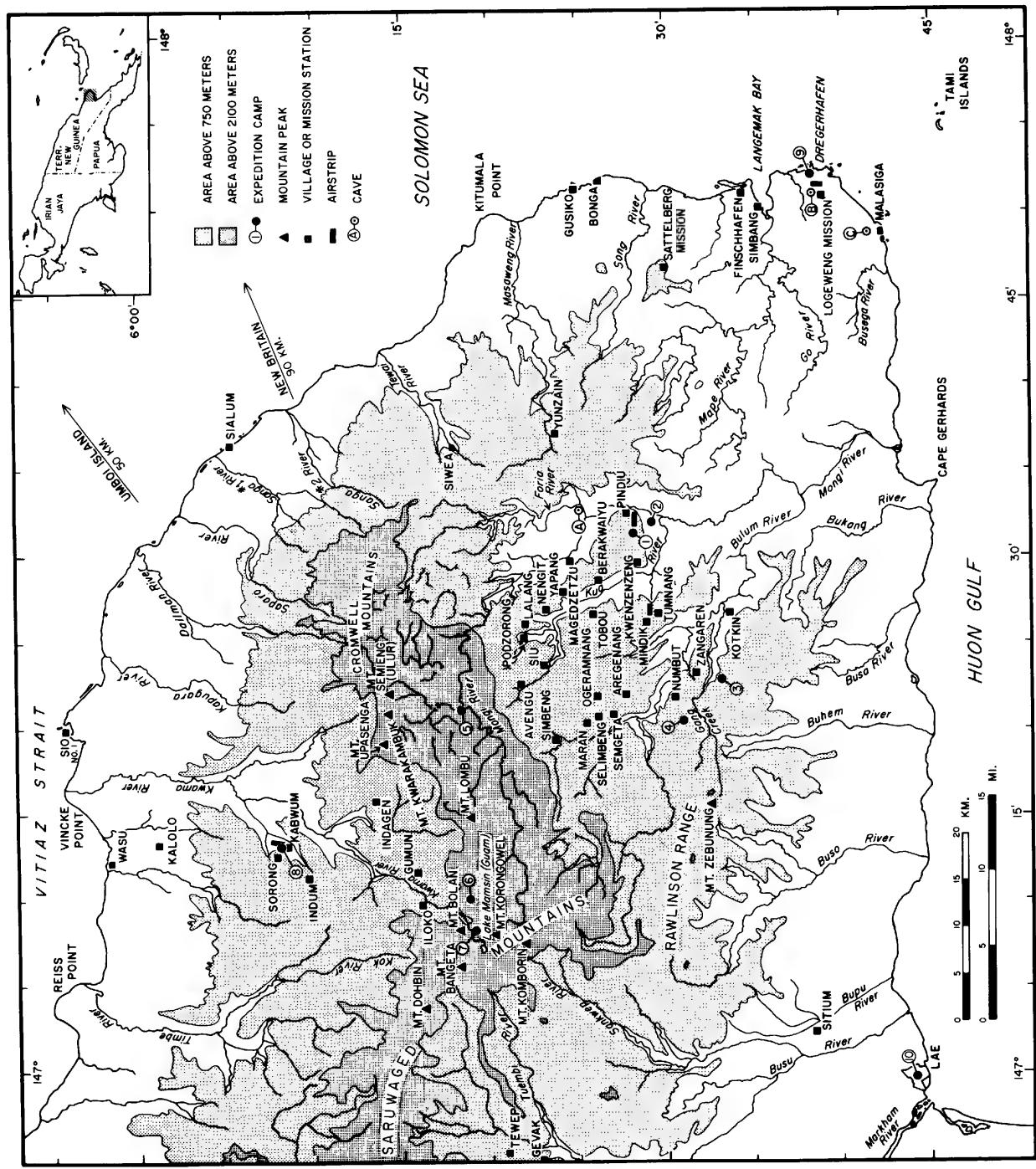


FIG. 12. The Huon Peninsula, showing collecting sites of the Seventh Archbold Expedition and other pertinent features.

Aregenang	147° 20'	6° 30'	Monarauwe (6, first Sarawaket camp)	147	10	6	20
Avengu	147 20	6 20	Mongi River	147	35	6	45
Berakwaiyu	147 30	6 25	Mount Bangeta	147	05	6	20
Bonga	147 50	6 25	Mount Bolan	147	10	6	20
Buhem River	147 20	6 45	Mount Dohbin	147	05	6	15
Bukang River	147 30	6 45	Mount Komborin	147	05	6	20
Bulum River	147 35	6 40	Mount Korongowel	147	10	6	20
Buma Cave (A)	147 35	6 25	Mount Kwarakambuk	147	20	6	15
Bupu River	147 05	6 45	Mount Lombu	147	10	6	20
Busa River	147 25	6 45	Mount Rawlinson (Mt. Zebunung)	147	15	6	30
Buso River	147 10	6 45	Mount Semieng (Mt. Ulur)	147	20	6	15
Busu River	147 05	6 45	Mount Ulur (Mt. Semieng)	147	20	6	15
Cape Gerhards	147 35	6 45	Mount Upasenga	147	20	6	15
Cromwell Mountains	147 25	6 15	Mount Zegunung (Mt. Rawlinson)	147	15	6	30
Dallman River	147 30	6 00	Nengit	147	25	6	25
Dregerhafen (9)	147 50	6 40	Numbut	147	20	6	30
Finschhafen	147 50	6 35	Ogeramnang	147	20	6	25
Finschhafen airstrip	147 50	6 40	Pindiu	147	30	6	30
Foria River	147 35	6 25	Pindiu Camp (1)	147	30	6	30
Gang Creek (and camp, 3)	147 25	6 35	Plains of Ulur Camp (5, Mannasat)	147	20	6	20
Gevak	146 55	6 25	Podzorong	147	25	6	20
Go River	147 45	6 35	Rawlinson Range	147	10	6	30
Gumun	147 10	6 15	Reiss Point	147	05	5	55
Gusiko	147 50	6 25	Sanga no. 1 River	147	35	6	05
Iloko	147 10	6 15	Sanga no. 2 River	147	40	6	10
Indagen	147 15	6 15	Sankwep River	147	00	6	30
Indum	147 10	6 10	Saparo River	147	30	6	00
Kabwum (village, patrol post and airstrip, 8)	147 15	6 10	Sarawaket Camp (6, first, Monarauwe)	147	10	6	20
Kalolo patrol post	147 15	6 00	Sarawaket Camp (7, second, Tempanpan)	147	05	6	20
Kapugara River	147 25	6 00	Sattelberg Mission	147	45	6	30
Kitumala Point	147 50	6 20	Seboagising Cave (B)	147	50	6	40
Kok River	147 05	6 05	Selimbeng	147	20	6	45
Kotkin	147 25	6 35	Semgeta	147	20	6	25
Kua River	147 30	6 30	Sialum	147	35	6	05
Kwama River	147 15	5 55	Simbang	147	50	6	35
Kwenzengzeng	147 30	6 30	Simbeng	147	20	6	25
Lae (10)	147 00	6 45	Sio no. 1	147	20	5	55
Lake Guam (= Lake Mamsin)	147 05	6 20	Sitium	147	00	6	40
Lalang	147 25	6 20	Siu	147	25	6	25
Langemak Bay	147 50	6 35	Siwea	147	35	6	20
Logeweng Mission	147 50	6 40	Song River	147	50	6	30
Magedzetu	147 30	6 25	Sorong	147	15	6	10
Malasiga	147 50	6 40	Tami Islands	147	55	6	45
Mannasat (Plains of Ulur Camp area, 5)	147 20	6 20	Tempanpan (7, second Sarawaket camp)	147	10	6	20
Mape River	147 45	6 35	Tewai River	147	40	6	15
Maran	147 20	6 25	Tewep	146	55	6	20
Markham River	147 00	6 45	Timbe River	147	05	5	55
Masaweng River	147 50	6 20	Tobou	147	25	6	25
Masba Creek Camp (2)	147 30	6 30					
Mindik	147 25	6 30					
Molesum Cave (C)	147 50	6 40					

Tuembi River	146	55	6	25
Tumnang	147	25	6	30
Vincke Point	147	15	5	55
Wasu	147	10	6	00
Yapang	147	30	6	25
Yunzain	147	35	6	25
Zangaren	147	25	6	30

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